

How to... Keep Things in Your Collection from Killing You! Hazardous Collection Materials

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The mission of many museums includes the mandate to collect and preserve artifacts. However, some of the objects and artifacts institutions are bound to preserve and protect from harm have the potential, if not handled properly, to harm us. Although it can seem frightening and overwhelming and an issue just easier to ignore, an institution can substantially reduce its risk to staff, volunteers, and visitors if it becomes informed about the potential hazards. The list below, although in no way exhaustive, can help you begin to assess the risks and hazards associated with objects in your collection and offer several options to control potential exposure.

Hazardous Materials Used On Collections

Since objects have been systematically gathered, caretakers of collections have attempted to discourage pest infestation to preserve artifacts. These efforts have led to the application of a wide variety of hazardous materials during preparation or storage. Several of the many popular but potentially hazardous treatments used on artifacts include ethylene oxide, arsenic, and dichlorvos (Vapona). A partial list of other poisons, pesticides, and fumigants that are known to have been used on collection items in the past includes tobacco, camphor, strychnine, mercuric chloride, naphthalene, paradichlorobenzene (PDB), dichlorodiphenyltrichloroethane (DDT), and cyanide. While these are no longer in use, their residues can still be present in, on, or

around artifacts and the places they have been stored and displayed.

Other types of treatments to objects in collections leave potentially hazardous residues as well. Sybarizing (or siburizing) was an arsenical mothproofing treatment applied to textiles by many local dry cleaners in the 1950s and 60s. Potassium cyanide was used to clean some gold and silver objects leaving a white residue that will turn into a dangerous gas if wet.

Hazardous Materials Inherent in Collections

Many types of museum collection items are made from components that are inherently toxic, dangerous, or hazardous or have the potential to become toxic, dangerous, or hazardous in time. Below is a list of different types of collection items and the possible hazards associated with them.

Archives: While many archival materials have never been far from the clean, dry, pest-free office environment in which they were created, others have had a far more peripatetic existence and can create several different types of health risks. Materials can be contaminated with asbestos from crumbling ceiling tiles and insulation. Staff with compromised immune systems can be adversely affected by mold and mildew from wet records. Other

contaminants include animal and insect waste that can harbor viruses and bacteria.

Mounts/Specimens: Many types of both wet and dry specimens were preserved using arsenic. Under no circumstances should any mount be used for "hands-on" demonstrations for children or adults before it is tested for the presence of arsenic. A source for arsenic test kits is listed at the end of this article.

Ethnography/Anthropology/Archeology: Many types of inherently toxic substances are used in ethnographic materials. Poisonous seeds may be used as decoration on clothing and in jewelry. Spears and knives may be coated with poisons. Grave goods are sometimes colored with red lead, white lead, cinnabar, and other toxic minerals and pigments. Objects may be contaminated with pathogens that can cause disease. Take appropriate precautions when handling objects that may contain fecal matter such as those removed from privy excavations or in areas that may have been contaminated with sewage.

Firearms/Armament/Edged Weapons: Unless you have verifiable written proof to the contrary, assume that all firearms are loaded and all shells, mortars, etc. are live. If deactivation of munitions is necessary, do not attempt to do it yourself! The sharp edges of spears, swords, and arrows may be coated with poisons or contaminated with bio-hazardous materials such as blood containing viable pathogens.

Film: Cellulose nitrate film begins to emit nitrogen oxide gases when breaking down. Besides being detrimental to your collection, these gases are lung irritants and repeated exposures may result in chronic symptoms. Acute symptoms include eye irritation, rashes, sores, vertigo, nausea, and headaches. A sweet warning odor may be emitted. When burned it emits a gas that can be deadly. Diacetate films emit acetic acid that can cause irritation to the upper respiratory tract. It emits a vinegary odor when breaking down.

Medical/Dental/Veterinary Equipment: Handle with extreme caution as such objects may contain viable pathogens, toxic, and/or controlled substances. Be extremely careful when handling containers as the substances may have leaked around stoppers or lids. The

linings of bags may hide sharp objects such as needles or the toxic residue of spills. Broken thermometers can leave mercury residues. Ether or nitroglycerine, which can be found in doctors' bags, become unstable over time and can form explosive substances that are very sensitive to movement. In such cases, consult your site's emergency procedures for dealing with bombs and explosives.

Textiles: Weighted silks may contain arsenic and lead added to the silk during the manufacturing process and can pose a serious health hazard. Do not handle such items without vinyl or latex gloves. A respirator with a HEPA cartridge should also be worn as air-borne dust can cause respiratory cancers when inhaled. Segregate the items from

other materials as these substances may migrate to other textiles. In the mid-1940s the military treated its wool cloth with DDT to protect it from moths and other insects. In a statement issued in 1992 the U.S. Army confirmed that it had handed out seven million uniforms and 1.5 million blankets that had been treated despite a ban on DDT initiated in the early 1970s.

Art: Pieces of art, especially contemporary art, can include any number of hazardous materials including but not limited to body fluids; sharps,

such as needles, knives, and broken glass; and, toxic pigments.

Metals: Beware of lead in items such as sculptures, stained glass windows, food cans, and old bullets. Lead corrodes rapidly forming a white powder that is easily inhaled, ingested, or trapped in clothing. Ceramics may have been covered with lead glazes. The mercury used to coat the back of old mirrors can break down and form a toxic solution found in the edges of old mirror frames.

Food: Old unopened cans may be contaminated with botulism. Bacteria inside may cause the cans to swell and explode harming staff, exhibits, and other objects in the collection. Very old cans may be soldered with lead.

Rocks/Fossils: Over two hundred types of minerals are known or suspected to be poisonous or cancer causing. Examples include specimens containing arsenic, asbestos, mercury, and those that are radioactive. Some rocks and fossils can be a source of radon, which is produced by the natural breakdown of uranium.

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Radiation: After 1898 many objects were coated with a paint mixture containing radium to make them glow in the dark. Although most no longer glow, they are still radioactive. Such items include: clocks, watches, compasses, instrument panels, light switches, doorknobs, religious statuary, and chamber pot lids. Be suspicious of any health cures with RAD or RADI in the title. The "Health Fount Radium Vitalizer" is a water dispenser that contained a large piece of uranium. The water was sold as a health cure.

Other: Toxic seeds were commonly used in jewelry, rosaries, rattles, and tourist items. Asbestos can be found in artificial ashes and ember sold for use in gas-fired fireplaces as well as older household products such as stoves, fireproof gloves, stovetop pads, ironing board covers, and certain hair dryers. It may also be found in automobile brake pads and linings, clutch facings, and gaskets. PCBs may be found in generators, transformers, and many types of industrial equipment. Many objects were made with or incorporated substances now known to be harmful and every effort should be made to find out about the composition of unfamiliar objects.

Simple Steps to Control Exposure

Now that some of the types of hazards have been outlined, there are a number of steps that can be taken to protect staff, volunteers, and visitors from exposure.

Inventory hazardous materials: Inventory the collection to ascertain what items have the potential for hazard. Review catalog cards for material types and lists of treatments. Visually inspect the collection for warning signs such as corrosion, bulging, strange odors, crystals, and other changes to the size, shape, appearance, and odor of an object.

Practice good storage, labeling, and handling routines: Use a storage method appropriate for the type of hazard, including hazardous storage cabinets found in many industrial supply catalogs. Ensure that others are aware of the nature of harmful materials. Label hazardous collection materials on the catalog card as well as on or near the object itself. Mark items in a way that will not permanently damage them. Hang tags, marked bags, enclosures in bags, and marked cabinets work well. Provide a tour of areas containing potentially hazardous collection materials to local fire personnel so that they will be familiar with the

types of hazards they might encounter in the course of fighting a fire at your site. Following proper handling guidelines such as wearing the proper type of gloves; donning smocks, lab coats, and other types of protective clothing; and, using carts instead of carrying an object, ensures not only protection of the object but protection of the individual handling the object as well.

Practice good housekeeping: Keep storage and work areas clean and free of dust and debris that can harbor harmful materials. It is good not only for the object but for those working with the objects as well. Work surfaces should be thoroughly wet mopped to ensure that hazardous particulates are not put in the air. When vacuuming is necessary, use a HEPA vacuum and wear a respirator with a HEPA cartridge as vacuum exhaust can circulate hazardous particulates. Change necessary filters often.

Practice good personal hygiene: Wash lab coats and other protective clothing frequently. Do not wear clothing home that has been contaminated, as hazardous materials can be passed along to your family. It takes quite a bit less of a toxic material to

affect children and household pets because of their small size. Wash your hands and face often and shower if necessary. Do not smoke, eat, drink, apply lipstick or balm, or contact lenses near toxic materials as the toxic materials are more easily introduced through the mouth and mucous membranes. Keep your tetanus shot up-to-date. Be aware of personal habits (licking fingers to turn pages, putting thread in your mouth, chewing on pencils or fingernails, etc.) that can facilitate the transmission of toxic materials.

Wear appropriate personal protective equipment (PPE): There is no universal type of PPE that can protect from all types of hazards associated with collections. Masks, gloves, safety glasses, smocks, respirators, and other PPE should not be considered the main source of protection from hazardous materials. They are not acceptable substitutes for good preventive methodology and should be relied upon for short-term projects or emergencies only. For example, if your collection contains specimens known to emit radon, using a respirator and gloves when accessing the collection is not enough. The materials should be housed in an appropriately vented cabinet to ensure that radon does not build up.

Maintain Material Safety Data Sheets (MSDS): This free fact sheet is provided by the manufacturer of potentially toxic and hazardous materials to explain the possible hazards of a substance and the measures required

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to use and handle it. Although not standard in format, each sheet contains the same information. Keep an MSDS on file and easily accessible (staff must know where it is!) for each hazardous substance including arsenic, lead, asbestos, ethylene oxide, etc. They are available from the manufacturer, vendor, or on the World Wide Web.

Dispose of hazardous materials properly: Dumping toxic or potentially toxic items in the trash or down the sink is not acceptable. Research the proper disposal method and seek out your hazardous waste disposal coordinator. Talk to a local hospital for more information about the disposal of potential biohazard material. Hospitals handle this type of hazardous material regularly and may be able to help.

Training, Training, Training! Invest the time and funds to train staff members appropriately so that someone is adequately prepared to address these issues. Begin a small library of books, periodicals, and pamphlets. Many are available free or at a nominal cost.

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Web Resources

ACTS--Arts, Crafts, and Theater Safety
<www.caseweb.com/acts/index.html>

Center for Safety in the Arts
<gopher://gopher.tmn.com/11/Artswire/csa>

Conservation On-line <palimpsest.stanford.edu>

Conserve-O-Grams
<www.cr.nps.gov/csd/publications/conserveograms/cons_toc.html>

Material Data Safety Sheets
www.pdc.corne.edu/ISSEARCH/MSDSsrch.HTM

Occupational Safety and Health Administration
<www.osha.gov>

Society for the Preservation of Natural History Collections
<www.uni.edu/museum/spnhc>

Arsenic Test Kits: VWR Scientific, P.O. Box 626, Bridgeport, NJ 08014; phone: 609/467-2600.

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